

WHAT IS CLAIMED IS:

1. An optical transmitter and receiver for converting a signal applied thereto from outside said optical transmitter and receiver into an optical signal so as to send the optical signal into an optical cable, and for converting an optical signal received by way of another optical cable into a signal so as to send the signal to outside said optical transmitter and receiver, said optical transmitter and receiver comprising:

10 a radio signal input unit for extracting transmission data from a radio signal applied thereto from outside said optical transmitter and receiver;

an optical signal transmitting unit for converting the transmission data output from said radio signal input unit into

15 an optical signal so as to send the optical signal into said optical cable;

an optical signal receiving unit for extracting data from an optical signal received by way of said other optical cable;

20 a monitoring unit for monitoring a transmitting state in which said optical signal transmitting unit is placed and a receiving state in which said optical signal receiving unit is placed so as to generate a monitor signal;

25 a multiplexer for multiplexing the data output from said optical signal receiving unit and the monitor signal output from said monitoring unit into reception information; and

a radio signal output unit for converting the reception information output from said multiplexer into a radio signal and for outputting the radio signal to outside said optical transmitter and receiver.

2. The optical transmitter and receiver according to Claim 1, wherein said radio signal input unit includes an antenna for receiving a radio signal applied thereto from outside said optical transmitter and receiver, a demodulation unit for demodulating the received radio signal so as to generate transmission information, and a separation unit for separating the transmission information into transmission data, which is to be converted into an optical signal by said optical signal transmitting unit, and a transmission control signal used for controlling said optical signal transmitting unit.

3. The optical transmitter and receiver according to Claim 1, wherein said radio signal output unit includes a modulation unit for modulating a carrier wave with the reception information output from said multiplexer so as to generate a radio signal, and an antenna for transmitting the radio signal output from said modulation unit to outside said optical transmitter and receiver.

4. The optical transmitter and receiver according to Claim 1, further comprising: a storage unit for storing results of a test and an adjustment which are carried out on said optical transmitter and receiver, wherein said multiplexer multiplexes the data output from said optical signal receiving unit, the monitor signal output from said monitoring unit, and the test and adjustment results into the reception information.

5. The optical transmitter and receiver according to Claim 2, further comprising an identification information storage unit for storing identification information used for

identifying said optical transmitter and receiver, and an identity detection unit for comparing identification information included in the transmission information with the identification information stored in said identification information storage unit, and for delivering the transmission information to said separation unit when the identification information included in the transmission information matches the identification information stored in said identification storage unit.

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6. The optical transmitter and receiver according to Claim 1, further comprising an identification information storage unit for storing identification information used for identifying said optical transmitter and receiver, wherein said 15 multiplexer multiplexes the data output from said optical signal receiving unit, the monitor signal output from said monitoring unit, and the identification information into the reception information.

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7. An optical transmitter and receiver for converting a signal applied thereto from outside said optical transmitter and receiver into an optical signal so as to send the optical signal into an optical cable, and for converting an optical signal received by way of another optical cable into a signal 25 so as to send the signal to outside said optical transmitter and receiver, said optical transmitter and receiver comprising:

30 a spatial optical signal input unit for receiving a spatial optical signal emitted in an outside space, and for converting the spatial optical signal into transmission information; a separation unit for separating the transmission

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information output from said spatial optical signal input unit into transmission data and a transmission control signal;

an optical signal transmitting unit for converting the transmission data into an optical signal according to the transmission control signal and for sending the optical signal into said optical cable;

an optical signal receiving unit for converting an optical signal received by way of said other optical cable into data;

10 a monitoring unit for monitoring a transmitting state
in which said optical signal transmitting unit is placed and
a receiving state in which said optical signal receiving unit
is placed so as to generate a monitor signal;

a multiplexer for multiplexing the data output from said optical signal receiving unit and the monitor signal output from said monitoring unit into reception information; and a spatial optical signal output unit for converting the reception information output from said multiplexer into a spatial optical signal and for emitting the spatial optical

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8. The optical transmitter and receiver according to Claim 7, further comprising: a storage unit for storing results of a test and an adjustment which are carried out on said optical transmitter and receiver, wherein said multiplexer multiplexes the data output from said optical signal receiving unit, the monitor signal output from said monitoring unit, and the test and adjustment results into the reception information.

9. The optical transmitter and receiver according to Claim 7, further comprising an identification information storage

unit for storing identification information used for identifying said optical transmitter and receiver, and an identity detection unit for comparing identification information included in the transmission information with the 5 identification information stored in said identification information storage unit, and for delivering the transmission information to said separation unit when the identification information included in the transmission information matches the identification information stored in said identification 10 storage unit.

10. The optical transmitter and receiver according to Claim 7, further comprising an identification information storage unit for storing identification information used for identifying said optical transmitter and receiver, wherein said 15 multiplexer multiplexes the data output from said optical signal receiving unit, the monitor signal output from said monitoring unit, and the identification information into the reception information.